

# *Montana Comprehensive Assessment System (MontCAS CRT)*

GRADE 4  
COMMON RELEASED ITEMS  
SPRING 2014



[opi.mt.gov](http://opi.mt.gov)

Montana  
**Office of Public Instruction**  
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# Science Directions

This Science test contains three test sessions. Mark or write your answers in the Answer Booklet. Use a pencil to mark or write your answers.

This test includes two types of questions: multiple-choice and constructed-response questions.

For the multiple-choice questions, you will be given four answer choices—A, B, C, and D. You are to choose the correct answer from the four choices. Each question has only one answer. After you have chosen the correct answer to a question, find the question number in your Answer Booklet and completely fill in the circle for the answer you chose. Be sure the question number in the Answer Booklet matches the question number in the Test Booklet. The example below shows how to completely fill in the circle.

CORRECT MARK	INCORRECT MARKS
<input checked="" type="radio"/>	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>

If you decide to change your answer to a question, erase the wrong mark completely before filling in the circle of the new answer. Be sure you have only one answer marked for each question. **If two circles are bubbled in for the same question, that question will be scored as incorrect.**

If you are having difficulty answering a question, skip the question and come back to it later. Make sure you skip the circle for the question in your Answer Booklet.

For the other types of questions in the Test Booklet, you will be asked to write your answers in the box provided. Read the question carefully. If a question asks you to explain your answer or to show your work, be sure to do so.

You may make notes or use highlighters in your Test Booklet, but you must bubble or write your final answers in your Answer Booklet. **Do not make any stray or unnecessary marks in your Answer Booklet.**

Let's work through a sample question together to be sure you understand the directions.

## Sample Question

1. What is the state animal of Montana?
  - A. elephant
  - B. giraffe
  - C. grizzly bear
  - D. zebra

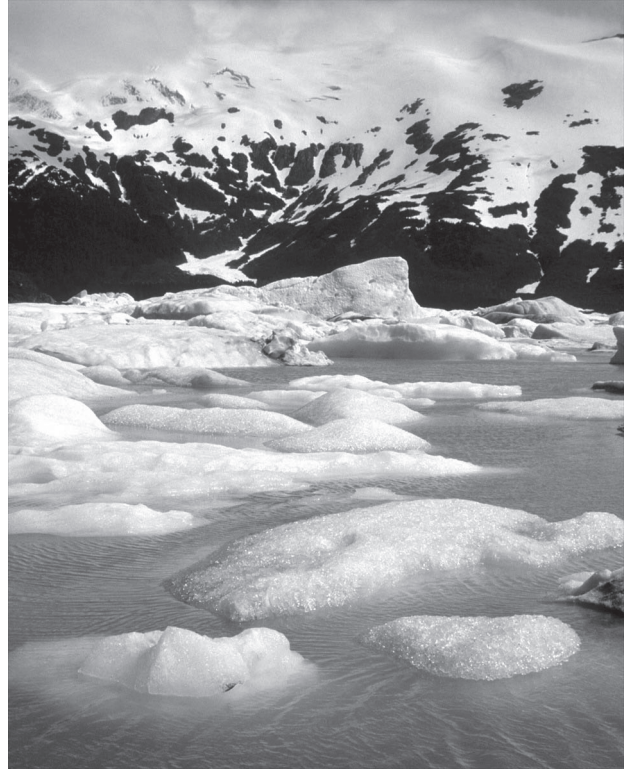
# Science

1. In darkness, how does an insect-eating bat know where to fly and where to find food?
  - A. It makes sound and listens to echoes.
  - B. It uses its sense of touch and not its eyesight.
  - C. It is able to smell food far away with its nose.
  - D. It sends out light rays from its eyes to see where it is going.
2. Some scientists study earthquakes. Which technology is **most likely** used by these scientists?
  - A. microscopes to study small organisms
  - B. computers to study how rocks move
  - C. space probes to study the surface of the Moon
  - D. lasers to study how light reflects

3. The grass is wet one summer morning in Miles City, Montana, though it did not rain overnight. What **most likely** made the grass wet?

- A. Grass gives off water at night.
- B. Snow melted as the sun rose.
- C. Water vapor in the air changed to a liquid.
- D. Water was forced out of the soil onto the grass.

4. A teacher took this picture while traveling during a summer vacation.



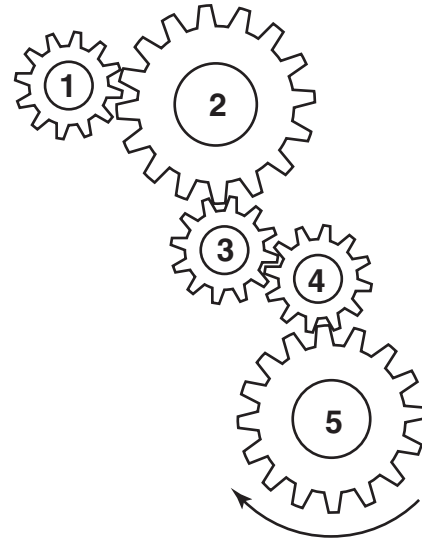
Based on the characteristics seen in the picture, which type of climate does this area have?

- A. dry climate
- B. hot climate
- C. moist climate
- D. polar climate

5. Earth's temperature is slowly increasing. Which of the following is happening because the temperature is rising?

- A. snowfall amounts are rising
- B. polar ice caps are melting
- C. winters are longer
- D. days are sunnier

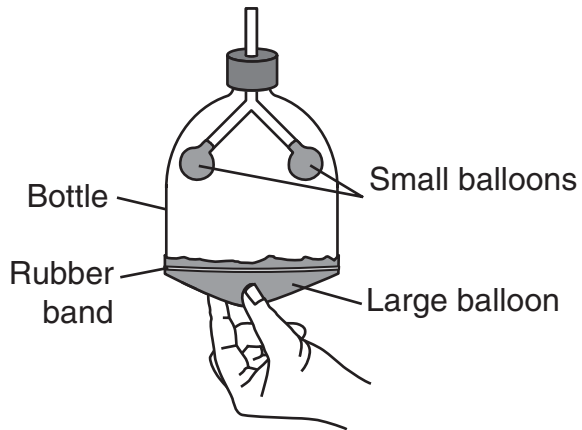
6. The picture below shows a system of gears.



Gear 5 is turned in the direction of the arrow. Which other gears will turn in the same direction? Draw arrows if necessary to answer the question.

- A. gears 1 and 3
- B. gear 4
- C. gear 2
- D. gears 1, 2, 3, and 4

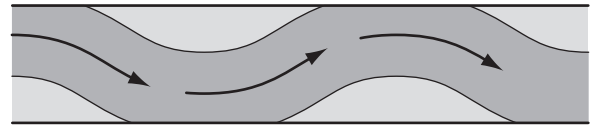
7. A model of a human body part is shown in the picture below. When the large balloon is pulled down, the small balloons fill with air.



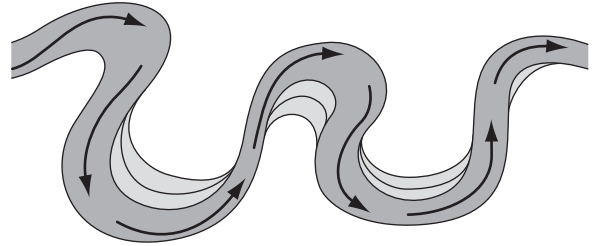
Which human body part is most like this model?

- A. heart
- B. lungs
- C. stomach
- D. veins

8. The pictures below show how a river looked a long time ago and how it looks now.



A long time ago



Now

What caused the river to change shape?

- A. The river dried up in the summer.
- B. The river started going backwards.
- C. The water changed the shape of the riverbank.
- D. The water plants changed the shape of the riverbank.

9. Which weather condition causes water to fall from the sky as a solid?
- A. high winds
  - B. humid air
  - C. cold temperatures
  - D. sunny skies

10. A student wants to find out how temperature affects the calls made by frogs.

- He placed frogs in containers with different temperatures.
- He counted the number of calls each frog made and measured the length of each call.

The data is shown in the table below.

**Frog Calls**

Temperature (°C)	Number of Calls in One Minute	Average Length of Each Call (seconds)
18	71	.31
20	80	.27
22	96	.24
24	103	.21

According to the data, which conclusion is **best**?

- A. Frogs make fewer but longer calls at warmer temperatures.
- B. Frogs make more and longer calls at warmer temperatures.
- C. Frogs make fewer and shorter calls at warmer temperatures.
- D. Frogs make more but shorter calls at warmer temperatures.

11. Why do scientists **mainly** use space probes?

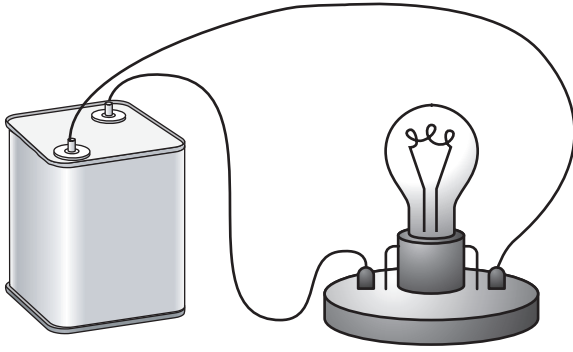
- A. to take astronauts to the Moon
- B. to orbit Earth and send TV, telephone, and other signals to Earth
- C. to investigate and collect data on distant planets
- D. to investigate the oceans on Earth

12. Why do constellations, or groups of stars, appear to change places in the sky from season to season?

- A. Stars move in a straight line through space.
- B. Earth revolves around the Sun.
- C. The Moon blocks different constellations at different times.
- D. Constellations rotate on a tilted axis.



13. The picture below shows an electric circuit.



What does electricity produce in this circuit?

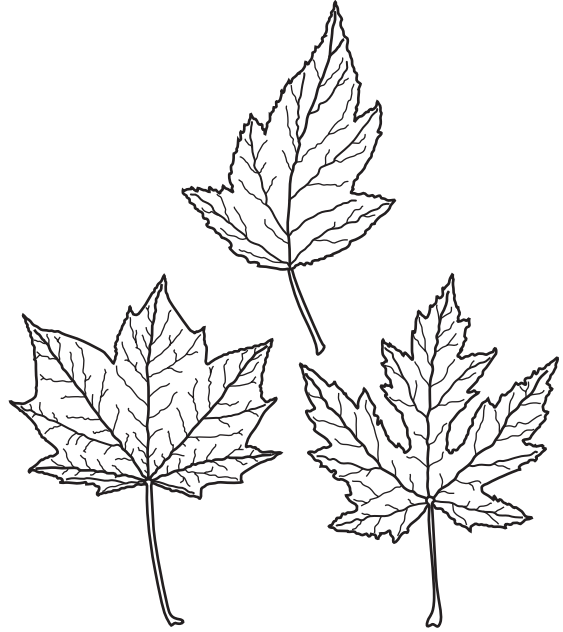
- A. a breeze
  - B. light
  - C. a picture
  - D. sound
14. A food chain is shown below.

dandelion → ground squirrel →  
red fox → mountain lion

Which organism in the food chain is an herbivore?

- A. dandelion
- B. ground squirrel
- C. red fox
- D. mountain lion

15. The leaves shown below are all from different types of maple trees.



Which characteristic makes all of the leaves maple tree leaves?

- A. the number of veins in the leaves
- B. the color of the leaves
- C. the width of the leaves
- D. the shape of the leaves

16. How do some animals react when their environment gets colder?

- A. They lose weight.
- B. They grow a thicker fur coat.
- C. They only come out at night.
- D. They live higher in the trees.

17. A student is sitting under a tree when an apple falls to the ground. What causes the apple to fall to the ground?

- A. gravity
- B. mass
- C. sound
- D. speed

18. During winter, a student noticed that sometimes ice formed on the outside of his bedroom window. The student recorded information in the table shown below.

**Window Data**

Date	Ice (yes or no)	Outside Temperature
12-30-2008	No	40°
1-15-2009	Yes	20°
1-25-2009	No	38°

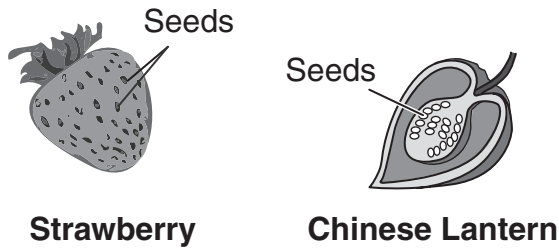
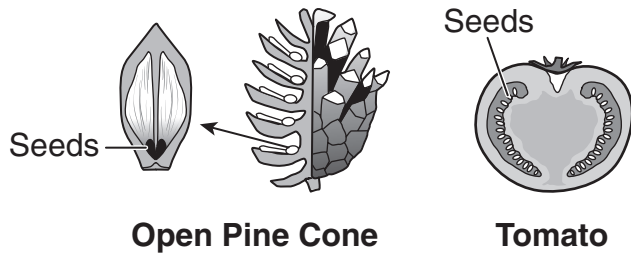
What question was the student trying to answer?

- A. How much ice forms on the window?
- B. At what time of day is it the coldest?
- C. How does the ice form on the window?
- D. At what outside temperature does ice form on the window?

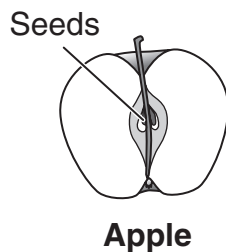
19. A student has to measure 100 milliliters of water for an experiment. Which science tool should the student use?

- A. gallon jug
- B. graduated cylinder
- C. scale
- D. teaspoon

20. Some plants produce seeds in special parts, as shown below.



The picture below shows an apple and its seeds.



Which two plants shown above produce seeds in a part similar to an apple?

- A. Chinese lantern and strawberry
- B. tomato and pine cone
- C. strawberry and pine cone
- D. Chinese lantern and tomato

21. Most mother birds protect their young. Which word **best** describes this behavior?

- A. extinct
- B. friendly
- C. instinct
- D. learned

22. Which of the following makes the **greatest** amount of heat energy?

- A. electric guitar
- B. flashlight bulb
- C. moonlight
- D. portable stove

23. Transparent materials let light through. A student shines a light onto four materials to find the most transparent one.

- Material W absorbed all of the light.
- Material X reflected all of the light.
- Material Y absorbed some of the light and let some of the light pass through.
- Material Z let all of the light pass through.

Which material is the **most** transparent?

- A. material W
- B. material X
- C. material Y
- D. material Z

24. Air and water can move easily through soil that has a large grain size. Which type of soil could air and water move through **most** easily?

- A. silt; grain size 0.005 mm
- B. clay; grain size 0.001 mm
- C. sand; grain size 2 mm
- D. loam; grain size 0.002 to 1 mm

25. A student wants to find out whether increasing the weight of a toy car changes the distance it can travel. The student follows these steps:

- She rolls a toy car down a ramp and measures how far the car travels.
- Then she makes the car heavier by taping 10 pennies to it and measures how far it travels.

What should the student do to make this experiment fair?

- A. Use the same ramp for each test.
- B. Test the car without the pennies attached on a higher ramp.
- C. Give the car a push when the pennies are attached.
- D. Stop the car after it travels 5 meters.

26. Scientists made the chemical DDT in the late 1800s. Farmers used DDT to kill insects that harmed crops. Later, scientists found that DDT is harmful to people and wildlife. DDT is no longer used in the United States. What does the history of DDT show about the scientific process?

- A. Scientists make up their minds and never change their views.
- B. Scientists learn new information but continue to do things the same way.
- C. Scientists learn new information and change the way things are used.
- D. Scientists who make new chemicals know everything about the chemicals they make.

27. Water is one of Earth's natural resources.

Describe three main steps of the water cycle. Tell whether water is a solid, a liquid, or a gas at each step.

### Scoring Guide

Score	Description
4	Response demonstrates a thorough understanding of the water cycle. The response includes three main steps of the water cycle and the states of matter of water along the cycle. Response contains no errors or omissions.
3	Response demonstrates a general understanding of the water cycle. Response contains minor errors or omissions.
2	Response demonstrates a limited understanding of the water cycle. Response contains major errors or omissions.
1	Response demonstrates a minimal understanding of the water cycle.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

### Training Notes

Sample responses include the following:

1. Liquid water is changed to a gas called water vapor in the air. Water is evaporated by the energy of the Sun.
2. Water vapor gets cold and changes back into a liquid, forming clouds. This is called condensation.
3. Precipitation happens when the air can no longer hold the condensed water and liquid water falls back to Earth. If the air is very cold, precipitation can fall as a solid (snow, sleet, hail).
4. Water that falls back to Earth is collected into oceans, rivers, and lakes or is absorbed by the land. It can be in the liquid or solid state depending on the temperature of the environment.

Note: A list identifying 3 correct titles of the parts of the water cycle = 1 point. One valid description and list of two titles = 2 points. Two valid descriptions and 1 correct title = 3 points.

## Example of Score Point 4

### Sample 1

The first part of the water cycle is evaporation. evaporation is when water changes from a liquid to a gas. Condensation is when a gas is changed from a gas to a liquid. precipitation is when liquid water falls to the earth as a solid or a liquid. The forms of precipitation is rain, snow, sleet, or hail.

## Example of Score Point 4

### Sample 2

The water cycle is an endless circle made up of three main parts, evaporation, condensation, and precipitation.

Evaporation is when the sun's heat evaporates the water and turns it into water vapor. The water vapor then rises into the air. At this point the water is a gas.

Condensation is when the water vapor gets cold in the sky and turns back into a liquid. This forms clouds.

Precipitation is when the water particles begin to form drops and fall to the earth as rain, snow, etc. At this point the water can be a liquid or solid.



### Example of Score Point 3

#### Sample 1

The three steps of the water cycle is evaporation and the water is rising into the air. It is a gas. The next step is condensation. It is also a gas. The very last step is precipitation and it is a liquid. Evaporation is where the water is rising into the air. Condensation is the clouds forming in the sky. Precipitation is the clouds releasing all the water in them and it rains or snows. Sometimes it can also hail or sleet. The water cycle is happening all the time. Those are the steps to the water cycle.



### Example of Score Point 3

#### Sample 2

In the first step in the water cycle is the water evaporates in to the air so the water is a gas. In the 2<sup>nd</sup> step of the water cycle is condensation that means the water is a ~~cloud~~ so the water is still a gas. In the last part of the water cycle is persipitation that mean it is raining, and the water is a liquid. That is the water cycle.

## Example of Score Point 2

### Sample 1

First, there water at its liquid form in a lake, Ocean or pond. Next, the sun evaporates the water and turns it into water vapor. Finally, the water gets to heavy for the cloud and a liquid known as rain falls to the ground as liquid. Then, the cycle starts all over again!

## Example of Score Point 2

### Sample 2

First evaporation happens the water goes into the sky, wich water is a solid. Then the water goes into the clouds which is condensation the water is gas. Finally precipitation happens and water falls down from earth which is a liquid. That is the water cycle.

**Example of Score Point 1**

**Sample 1**

It rains on the ground. Then the sun comes out. The rain goes back up.

**Example of Score Point 1**

**Sample 2**

Evaporation condensation and precipitation.

Example of Score Point 0

Sample 1

1<sup>st</sup> stept gas 2<sup>nd</sup> step solid 3<sup>rd</sup> step  
liquid

Example of Score Point 0

Sample 2

S<sup>1</sup> Water is good for animals. S<sup>2</sup> Water is good for  
people. S<sup>3</sup> Water is He thy.



